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'TwitFic', Twine, and Student-Centred Learning: Combining Creativity and Coding in the Classroom

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Abstract

This paper explores the most effective way to teach creative problem-solving in a variety of classroom environments, from a traditional face-to-face course structure to distance-learning to individual workshops. Creative problem-solving is a crucial skill in a global, local, or 'glocalised' economy. Whether creativity can be taught and if so, how, has been covered extensively (Best, 1982; Lindström, 2006; Fasko, 2001; Cropley, Westwell, & Gabriel, 2017), but very little research examines the specific use of digital media and mobile applications in an interdisciplinary learning environment (Clark, Hergenrader, & Rein, 2015). Multimodality, social media, and interactive story-telling tools such as the program Twine combine the arts and sciences in a way which allows students to learn both analytical and creative problem-solving techniques while encouraging ingenuity and self-motivated discovery. Through a combination of comparative analysis, classroom observation, and original research, this paper describes best-practices and example case studies for teachers and facilitators interested in fostering an effective, sustainable learning environment. By incorporating creative writing projects, students can apply their own knowledge and context to any particular learning outcome, proving that they have integrated the information and synthesised it in a way which makes it more personal and relevant to their lives. Whatever students' future careers paths, creative writing in a digital medium gives learners a broad range of practical, adaptable skills for the modern job market while remaining local, student-centred, accessible, and applicable to their spheres of knowledge.

Keywords: *multimodality, student-centred learning, creative writing, Twitter, Twine*

The most effective classroom is the one where students are excited and eager to learn. Whether that classroom is structured around traditional face-to-face interactions, distance learning, or one-off workshops, the most effective educators are those who foster that environment of excitement and passion in their students. This paper will examine ways to combine lessons in creative writing with lessons in computer literacy in a way which centres individual students' learning goals and

personal experiences, which are key aspects to inspire self-motivated discovery in the classroom. The case studies represent successful implementation of digital tools by other educators, and the sample project ideas are intended as jumping-off points for teachers who haven't yet included the tools discussed below in their classrooms.

The key idea with the samples provided is that they are customisable projects easy to adjust according to a student's technical

and writing skills (although somewhat dependent on educators, if not knowing how to do something, at least knowing the resources or where to find the resources to help students figure it out) as well as their preferred learning style. This customisation allows students to bring in their own ideas and personal goals to increase interest and excitement, which increases intrinsic motivation and lengthens retention rates of material. The focus on a mere two resources, Twitter and Twine, is because they are some of the easiest digital tools for students who have little-to-no coding or creative writing experience. They also have some of the gentlest learning curves for those educators who themselves may not have an extensive background in digital, multimodal storytelling.

Multimodality is a way of engaging learners in multiple ways, or 'modes', which lends itself naturally to different learning styles and increases the ways students can approach and work with material. More than just the verbal mode, a multimodal lesson might include images or videos; sound, movement, and action; roleplay; and any other number of ways to engage more than just one of the senses. Gilakjani, Ismail, and Ahmadi's 2011 investigation into language-learning with information and communication technologies (ICT's), along with their thorough survey of other successful applications of multimodality in the classroom (pp. 1322-3, pp. 1325-6), found that 'each modality contains information that is a resource for pupil's meaning construction' (p. 1325) and concluded that 'a multidisciplinary approach is needed to understand the social, cognitive, cultural and linguistic variables involved in the process of language learning' (p. 1326). Miller & Mair (2006) had similar findings in the field of engineering and product design, concluding that incorporating multimodal teaching methods enhanced creativity (p. 6), and Edwards-Groves (2011) advocates, through a series of case studies of primary school writing

instruction, for the inclusion of technology to teach both composition and the elements of design. Sindoni, Wildfeuer, & O'Halloran (2017) edited a comprehensive review of multimodality in the performing arts, with their resultant analytical framework just as multimodal, and just as flexible, as the divergent performances and cultural artefacts they study. Approaching pedagogy with an agile, creative mindset facilitates agile, creative thinking--both in educator and student.

Multimodality, Creativity, and Creative Writing

Multimodal lessons lead easily to more creative lessons, lessons which both promote and reward creativity, as students are expected to apply their knowledge in multiple ways to multiple ends. The research on creativity in the classroom is vast, and whether and how creativity can be taught has already been covered extensively (Best, 1982; Craft, Jeffrey, & Leibling, 2001; Fasko, 2001; Lindström, 2006; Cropley, Westwell, & Gabriel, 2017). Instead of re-treading those arguments, this paper takes as a given that creativity and creative problem-solving are skills like any other and can be taught, practised, and applied. For the definition of what creativity is, this paper takes Veale, Feyaerts, & Forceville's (2013) definition: 'creativity is not an objective property of a process or product, but a perceived quality that emerges from the interplay of actor, process, and audience....[and] this interplay is located in a specific context and motivated by a specific goal' (p. 16).

Creativity resists automation in a way many other jobs don't, and the accessibility and ease of publication in social media allows students to share and engage with others. Creative writing in a social media and tech application gives students a broad range of practical skills for the modern job market and global, connected, internet-of-things economy (while remaining local, student-centred, and applicable to their spheres of knowledge and context). By dovetailing creative writing with computer

literacy skills such as front-end coding, educators can offer an environment where students are allowed to incorporate their own interests and passions into their projects, which enables students both to apply a lesson to their own personal context as well as apply their own personal context to a lesson. The careful choice of prose and consideration of intended audience learned in creative writing is easily transferred to the attention to detail and user interface (UI) awareness needed in programming.

Creative writing is a highly individualised process despite commonalities in the craft, and a student-centred environment is a must. The collection of essays in *Creative Writing: Writers on Writing*, David Lodge's *Consciousness and the Novel*, and Mia McKenzie's *Black Girl Dangerous: On Race, Queerness, Class, and Gender* all highlight the individuality of the writer at the same time they show the similar ways in which writers draw on personal experiences to create their fiction. In *Creative Writing*, for example, Fred D'Aguiar writes that he 'start[s] with an image of a person or a thing or a person attached to a thing....The image works in tandem with a mood, flavour and sound' (p. 26) while Jane Draycott believes that writing poetry is 'a part of the process by which the material from one's everyday apprehension of the world draws on and is ignited by ideas or images beyond it, and vice versa' (p. 38). Kathryn Heyman asserts that 'this is surely the lifeblood of writing, this desire and ability to revisit and reclaim buried moments and reshape them' (p. 57), Sabyn Javeri agrees that writing is 'not just a way of stretching the imagination but also of discovering one's own self' (p. 108), and Emily Raboteau expresses a similar idea: 'to a certain degree, all fiction writers draw from their autobiographies to authenticate their work' (p. 160). Lodge, in his 2002 work, adds his voice to the chorus, writing: 'literature is a record of human consciousness, the richest and most comprehensive we have' (p. 16). Barbara Tomlinson conducted a massive analysis of

hundreds of comments of writers on writing and organised the data into various similarities in metaphorical language, citing her reasons for doing so as: 'probing the dynamics and origins of composition has long been related to efforts to discern core truths about human creativity, selfhood and subjectivity' (p. 11). For students trying to find their way in a globalised world, processing their own experiences, thoughts, and opinions is a crucial first step.

Digital Age, Knowledge Age

In 2011 the Human Rights Council of the United Nations published a special report in which access to the internet was declared a fundamental human right (p. 1), recognising that 'the internet has become a key means by which individuals can exercise their right to freedom of opinion and expression' (p. 7) in addition to the numerous other benefits it provides. The internet can be an egalitarian force for communication across the world, but only so far as people are able to access it and use it in a competent, literate way. Computer skills are an invaluable tool for students both during their studies and once they enter the workforce, and a skillset which combines strong written, oral, and verbal communication with creative problem-solving and analytical thinking makes for citizens who are agile in their mindsets, flexible in their approach to conflict, and adaptable in a rapidly changing local and global environment (Marginson, Murphy, & Peters, 2008, pp. 8-11, pp. 201-4; Veale, Feyaerts, & Forceville, 2013, pp. 16-8; Trippstad, 2017). Fostering an interdisciplinary learning environment which incorporates multimodal lesson plans and student-centred tasks and objectives is the most effective way to prepare students for a 'glocalised' world. A simple internet search will turn up thousands of authors, editors, and publishers giving advice to aspiring and seasoned writers alike, alongside such print standbys as Natalie Goldberg's 1986 text *Writing Down the Bones*, David Lodge's

1992 classic *The Art of Fiction*, Anne Lamott's 1994 poetry-focused *Bird by Bird*, or Ursula K. Le Guin's 2015 update of *Steering the Craft*. There are also a wealth of free resources for learning to code, easily accessed through an internet search, with some of the most popular at the time of this writing Stack Exchange's programming and code reviewing sections, GitHub's Project Showcase, and Google's Closure Library. The Mary Sue, a popular feminist site with a focus on science, technology, and geek culture, offers a coding bundle where learners pay only what they want to pay, and code-writing software like Notepad++ (<https://notepad-plus-plus.org>) and BlueJ (<https://www.bluej.org/> BlueJ) are free to download for anyone who wants to start writing code. Software Development Kits (SDK's), or devkits, for developing apps in platforms like Android or iOS abound, and for aspiring gamers engines such as Unity (<https://unity3d.com>), Game Maker Studio 2.0 (<https://www.yoyogames.com/gamemaker>), Unreal Engine 4 (<https://www.unrealengine.com>), Godot (<https://godotengine.org>), and publishing platforms such as Twitch (<https://www.twitch.tv>) and Steam (<http://store.steampowered.com>) are all free or free-to-try--let alone the concept of Game Jams, where coders and creators get together to make a game in a weekend. In the world of open-source code, the barriers to entry reside mostly in the language barrier, since the most popular programming languages are based on English, and the access to a viable computer and the internet. With such a sea of information geared towards self-taught learners of writing and coding (and just about anything else under the sun), it can be difficult if not overwhelming as an educator to choose which resources to introduce to a classroom--let alone that programming languages become more or less popular over time (DeNisco, 2017). It's important to remember, too, that the self-taught format

works for some students but not others. Self-taught courses are certainly the ultimate in student-centred learning, but an instructor or facilitator can serve as an invaluable guide, sounding board, and source of advice when trying to choose a particular track or when wrangling with technical difficulties. While some creators are perfectly content to hunt down their own learning objectives, write their own goals, and set out to achieve them--scouring resources like The Submission Grinder's customisable search tool to find that perfect publication fit--many others need the positive support and community which can be so vital after a string of setbacks.

Biases and Disparities in the Publishing Industry

A 2016 special report by *Fireside Fiction* on racism in speculative fiction publishing found that authors in American magazines were disproportionately White. In fact, as the report explains, while 13.2% of the population in the United States is Black, only 1.96% of stories published were by Black authors (White, 2016). John G. Russell writes that 'absence has characterised the genre's representation of non-Whites' (19). A 2015 study of the UK publishing marketplace concluded that 'the best chance of publication for a BAME [Black, Asian, or minority ethnic] novelist is to write literary fiction that conforms to a stereotypical view of Black or Asian communities' (Kean, p. 8). BAME novelists responding to a survey as part of the UK study felt a general lack of control in the publishing industry, as the study notes that 'there was general pessimism among BAME novelists that the industry would change....[and] a sense of weariness among the most established novelists that they still struggled to challenge stereotypes' (p. 10).

In terms of gender, the research is equally bleak. Researchers Melinda Harvey and Julianne Lamond concluded in 2016 that major Australian book reviews are dominated by men, where for example in

the prominent newspaper *The Australian*, only 26% of books reviewed in 2015 were by women (p. 96). Their data analysis of book reviews from 1985 through 2013 found a certain gender essentialism at work, whereby it was assumed by reviewers that 'books by men are for everybody but books by women are only for women' (p. 97), and that despite the lower levels of the publishing industry being dominated by women, men still hold the majority of senior-level positions and prizes (p. 104).

The 2015 VIDA Count, an annual report commissioned by VIDA: Women in Literary Arts, a non-profit feminist organisation based in the U.S., took an intersectional approach to its cataloguing of disparities in publishing for women, people of colour (POC's), LGTBQ+ writers, and writers with disabilities. Unsurprisingly, women are underrepresented, and women of colour, or women with disabilities, even more so. Of the fifteen major publishers catalogued by the VIDA Count, eight did not publish any bylines by women writers who identified as having a disability. Of those that did, four of the publications had just one byline each, for a total of a mere four women during the entire year. *The Threepenny Review*, a premier literary magazine, published no works by women of colour, and *Granta*, another major outlet, published only three. The institutionalised biases in favour of Whiteness, and maleness, as well as other aspects of a privileged identity, are compounded in the publishing industry as in most other aspects of society, so that White men are published the most, and White women are published more often than women of colour.

One way to combat these inegalitarian barriers to publication is to publish outside of the major outlets and houses, as N. K. Jemisin notes in her interview with Brian J. White of *Fireside Fiction* in response to their 2016 report. She mentions the awareness of Black writers of the White-dominated publishing industry, explaining that 'Black

writers have their own market. They've got their own place to go. There's a thriving field of self-published stuff in particularly Black fiction' and that there's a gigantic market of self-published and small press published Black fiction that kind of eschews the whole traditional published market simply because...the traditional publishing industry basically treated Black writers as if they were anomalies. They would let in the occasional one whose work appealed to White writers.

When asked about the beginnings of this lucrative, productive market for Black speculative fiction, Jemisin responds: 'I would say that that was originally created by the industry's reluctance to publish Black writers who weren't trying to appeal to White readerships or non-Black readerships.' To that end, introducing Twitter and Twine, as well as other free-to-use and free-to-publish tools, to the classroom can allow students who are members of marginalised groups to publish their work and correspond with other members of their community. The individual and group projects discussed below are an excellent way for educators to facilitate the publishing of aspiring writers' material in a way which allows them to engage with other creative writers and get their work out into the public sphere without having to pass through those same gatekeepers who are overwhelmingly White, male, heterosexual, able-bodied, and middle- to upper-class.

TwitFic: Writing Short

The short story dominated ink-and-paper magazines for decades before the digital age, but with the arrival of social media sites such as Twitter (<https://twitter.com>), some fiction writers and magazine editors have adapted to the new medium. Magazines such as the UK-based *Litro*, for example, created a story entirely composed of reader-submitted tweets, aggregated into one long thread (Cleaver, 2013). The exact word count definition of flash fiction

varies, but it is commonly cited as anything less than 1,000 words (Mackenzie, 2016), with most magazines that publish it providing exact cut-offs on their respective websites. Shorter still is micro fiction, nano fiction, and all the way down to twitfic at 140 characters or less--the length of a single tweet. Of course, very short fiction is not an innovation of the age of the internet, as a six-word story attributed to Ernest Hemingway, 'For sale: baby shoes, never worn,' illustrates. And while the attribution is most likely apocryphal (Ernest Hemingway - Baby Shoes, 2009), the creative problem-solving which can result in working within a finite set of constraints can easily carry over to other artistic or scientific endeavours.

Flash Fiction, Social Media, and Narrative

Twitter has been much-lauded for its egalitarian design, making it easy for like-minded activists to form groups and correspond (Ramsey, 2015) at the same time it has been shamed for its continued lack of response to hateful, threatening, or even downright violent harassers (Alba, 2017). Like the other resource discussed in depth here, Twine, it is still a free-to-use and free-to-publish site (unlike sites such as Amazon.com, which charge their authors for self-publication), and thus an accessible option for any writer trying to get their fiction out into the public sphere--in spite of its more gruesome internet trolls. Deviant Art's Fiction section, in addition to many other so-called 'fanfic' sites, is also a dedicated warehouse for self-publishing authors, and can be incorporated into the sample projects below for final publication, but will not be discussed in depth. Dedicated semi-professional and professional outlets exist for aspiring 'twitfic' authors, such as the sites Nanoism (<http://nanoism.net>) or NANO Fiction (<http://nanofiction.org>), but while these platforms provide payment to writers, even if only at token levels, they can be just as prone to the same institutionalised and unconscious biases

which plague the larger magazines and major publishing houses.

Most current users of social media access and engage with the various platforms as a form of autobiography or news collection. Status updates, tweets, photos, and check-ins tell a user's group of friends or followers what they're doing, how they're feeling, where they're travelling, and what they're eating. Social media becomes a way to show identity and group-belonging when a user shares or reacts to news articles or other posts, and it's a powerful way to achieve solidarity and consensus. However, in the case of educators looking to incorporate multimodality and creative problem-solving into their curricula, social media is an outstanding tool to combine artistic and language skills with scientific reasoning and front-end programming. Most young adults have some exposure to social media, and it is only a short jump from using a platform such as Twitter to tweet real-life experiences to using Twitter to tweet the experiences of a fictional character.

The ease of opening a new Twitter account and the low level of bandwidth it requires to use the Twitter Lite version of the service (Traugher, 2017)--coupled with the brevity of the medium--makes it a perfect introduction to creative composition and basic computer literacy skills. With private groups and tweets, educators can keep student groups as insular or outward-facing as they desire, and Twitter itself naturally creates challenges for learners at all levels. For complete 'newbies', practising skills such as embedded links and images allow for tangible, quantifiable goals that are still within range of achievement. For those students who have extensive experience with the platform, there are a wealth of resources online for open-source projects (or widgets) to embed tweets into a personal or professional blog up to and including developing their own apps which interact with Twitter's application programming interface (API). With some pre-planning and assessment of each student's knowledgebase and goals,

an educator can easily create assignments which require tweeting and scale difficulty up or down. Even better, the Twitter community lends itself to student interaction and feedback, which allows students to practise critically engaging with their own work as well as that of their classmates. Because of Twitter's ability to embed photos and videos, each tweet encourages students to think multimodally--that is, not just in words but in images, sounds, and action.

Case Studies and Sample Project Ideas

It is an easy thing to advocate for educators to add Twitter to their teaching toolkit and quite another to be the actual educator sitting down to write a lesson plan, design a course curriculum, or plan out a workshop. To that end, these case studies and examples of individual and group projects should spark further ideas and iterations. As with all student-centred classrooms, every mix of learners will be different, and even the best idea needs to be tailored to suit the needs of the students.

Case study: twitfic and micro blogs

Abigail G. Scheg, as part of the collaboration of creative writing teachers in Clark, Hergenrader, & Rein's (2015) edited volume *Creative Writing in the Digital Age: Theory, Practice, and Pedagogy*, outlines her use of Twitter and microfiction in the classroom as part of her class's participation in the project #25WordStory (pp. 121-8). In it, Scheg highlights what she believes to be one of the most important aspects of using Twitter for creative writing, that it 'represents a virtual, global classroom of collective intelligence and an epistemological shift in which the "experts" in the exchange are not necessarily the traditional teachers' (p. 123). She emphasises Twitter's ability to teach students the importance of concise, precise language in much the same way that poetry does (p. 123). Scheg's students were bound by the constraint of telling a story in 25 words--no more, no less--and it produced a wealth of innovative solutions to a set problem. Each student grappled

with the word count, or character limit, in different ways, perhaps by using unique abbreviations or eliminating punctuation, with the result of increased confidence in her students as each puzzled through their own solutions and passed them on to others in the class (p. 123-125). Overall, setting an exact limit on the entire class gives the teacher control over the parameters of the assignment, and rather than stultifying creativity, it allows it to flourish.

Individual project idea

To help teach students divergent thinking and to stretch their minds beyond typical flat character clichés, an excellent creative writing assignment designed for Twitter is that of the fictionalised community. Each student can create their own hashtag, in order to group the tweets together, or create one long feed. The catch is that they must have multiple accounts from which they're tweeting, each one with its own character profile designed by the student. Educators can decide if students are only allowed to interact with their own other, imagined characters, or if each character can only interact with the imagined characters of other students. Ideally, the characters are in conflict in some way, to create tension for the larger narrative, which is an excellent way to introduce ideas of interpersonal and intrapersonal conflict as well as pull in ideas surrounding conflict mediation and political groups, if the educator so desires. The project is an easy one to make interdisciplinary or to incorporate real-world news, such that the students' imagined characters are responding to a current event or using current events to advance the story.

Group project idea

While the standard group project with creative writing is a story in which each author submits one small piece, such as *Litro's* Twitter story, group projects can extend well beyond each student writing down the next paragraph in the narrative like some sort of mad lib. For example, the individual project described above could

be expanded into a group project, splitting students into teams of imagined characters to create a much larger drama, or students could be given completely free rein save for one teacher-imposed restriction. Centring the group projects around a larger theme makes for easier assessment for educators new to the format, and also helps channel students who may have no idea where to start. Perhaps the theme of the project is a particular historical event, and each group must tweet as though they were living through it in real time from a specific perspective such as political leaders, average citizens, medical personnel, or foreign nationals. Students in each group can either all be given the role of writer, coder, and creator, or each student in the group assigned a different role. Perhaps one student is responsible for drafting and posting tweets, while another is responsible for creating multimodal media such as illustrations, graphs, and videos, and another is responsible for creating a fictional website posting news reports about the historical event. There is no limit to the iterations of the various tracks an educator can choose to focus narrowly or broadly according to the particular goals of the classroom.

Twine: Writing Long

While even those students who choose not to engage with social media are still aware of its presence and basic function, many students will not have encountered interactive digital fiction before. Interactive fiction is narrative which requires readers or audience members to make a choice, such as the popular *Choose Your Own Adventure* series. Where the line between interactive story and game lies is a subject of debate, most especially so when comparing point-and-click and text-adventure games (including analogue versions such as *Dungeons & Dragons*) with fiction tagged as 'interactive'. The focus in this section will be on those interactive stories created in the program Twine,

although numerous other media exist to the same or similar purpose.

Interactive Fiction, Empathy, and Inclusion

Twine (<https://twinery.org/2>) is one of many freely available programs for digital interactive fiction, sometimes called HTML fiction, hypertext fiction, or nonlinear fiction, and while there are some magazines which pay authors professional rates to publish it, such as *sub-Q* (<https://sub-q.com>) or *Strange Horizons* (<http://strangehorizons.com>), interactive fiction has not entered the public consciousness in quite the same way as Twitter. Still, interactive fiction, even more so than twitfic, has tremendous potential for students to practise both their creative writing and their coding skills in a single, interdisciplinary, multimodal project. For most students, the coding languages involved will be front-end languages such as HTML5 or CSS, those languages used to present information to the user--or, in this case, the reader. However, if students are well-versed already in these languages and looking to expand their skillset, or if their skillset lies in back-end languages such as Java or Python (those server-side coding languages which provide the 'nuts and bolts' of the internet), an educator or the students themselves can take their project in a different direction in order to provide other challenges. One example could be working with graphic design and illustration software such as PhotoShop or perhaps animation or music-editing software. Whatever resources the student wants to include in their interactive story can be included at a level challenging enough for the student to stretch themselves but not so difficult as to become frustrating or demoralising.

For beginning creative writers, drawing on autobiographical source material becomes even more powerful with the added interactivity of Twine. Especially so for those students who are members of marginalised groups commonly shut out of mainstream publishing, telling a story in

a way which forces the reader to make choices in the narrative not only shares first-hand experiences with the reader but also creates a more powerful empathic experience. Even more so than passively reading a novel (or a tweet), making active decisions within a story structure and experiencing on a personal level the consequences of those decisions can instil in a reader of interactive fiction 'what it's like' to be someone else. As Anita Sarkeesian asserts in the context of videogames as an interactive medium, 'videogames are uniquely positioned to provide experiences that do all of these things [learning about the world through observation and imitation], because in most games, the player occupies both the role of participant and the role of spectator to their own actions' (30:50). Or, alternatively, it can instil in a reader struggling to find fiction about people like them the reassurance that they're not alone, that other people have had similar experiences. Each interactive story also encourages multiple read-throughs to experience all the various endings, which is invaluable as a way to encourage multiple critical interpretations of a text. In keeping with other studies which have produced similar results, Daniel Kidd and Emanuele Castano found in 2016 that engaging with literary fiction and complex, round characters increased empathy and pro-social behaviour in individual readers (pp. 1-2, 9-10). With online interactive fiction, students no longer have to receive approval from a small group of publishers to or wait for someone else to tell their stories. They can upload them, share them, comment on them, and receive feedback from others.

Case Studies and Sample Project Ideas

Examples of interactive fiction are as varied as there are stories to tell. Any short story or novel can become an interactive narrative online. In this way, using Twine lends itself more easily to a traditional creative writing course or lesson plan than Twitter, as it already relies on the structure

of a short story. However, any narrative can be just as experimental as a student desires: for example, a Twine story made up entirely of Twitter feeds of which the reader must choose only a select few to navigate. How much HTML or CSS a student chooses to include depends largely on the goals of the course and the personal goals of the student. The technical component, as mentioned above, could instead focus on digital photo manipulation or digital illustration. Depending on the length of the course, a student could create a portfolio of several interactive short stories or just one.

Case study: character-driven stories and interactivity

Educator Aaron Reed chose the program Inform 7 for his students' foray into interactive fiction, but the lessons learned from the project easily apply to Twine, a more intuitive platform for those just starting out (Clark, Hergenrader, & Rein's, 2015, pp. 143-4). Many of Reed's difficulties stemmed from unfamiliarity with the deeper levels of Inform 7's code and ability to process somewhat natural language, which would be mitigated by substituting the more user-friendly Twine. One of the main takeaways Reed had himself was that IF [interactive fiction] authors share the desire of any writer to create beautiful prose and compelling stories, so the text's functional purpose must be woven into its aesthetic goals, even if these at times seem at cross-purposes....By asking authors to continuously work to craft a specific mindset in the player, IF encourages the kind of intentional thinking that is just as useful in traditional writing, where helping the reader understand a character or concept can require equal care and precision. (143)

By teaching his students to guide readers through a text-based game, they learned the sort of situational thinking and awareness of audience and purpose that all good communicators must have. It creates an emphasis on character-driven stories (p.

145, p. 147), as opposed to plots that ferry the protagonist along without the protagonist making active choices. Echoing the writers quoted above, Reed asserts that, as with traditional fiction, 'people have fun designing interactive stories; it's a surprisingly beguiling activity, tapping into our natural urge to manufacture secrets and then share them with each other' (pp. 150-1). Reed considers his use of interactive fiction in his creative writing workshop a resounding success, concluding that his students 'produced surprising and invigorating stories that engaged with the creative possibilities of an interactive medium, with prose often reflecting the greater thought and attention to detail provoked by the unique constraints of IF' (p. 147). Most notably, not a single one of his students quit or gave up (p. 151).

Individual project idea

Given Twine's use of hypertext to link up various threads in a story, it is an ideal way to introduce students to the basics of the document object model, or DOM, of front-end web page design. A single story can include links, images, sound files, and videos, allowing students the opportunity to manipulate various multimodal resources in a single presentation of narrative. An excellent way to help students stay passionate and motivated about the project despite technological setbacks is to set the assignment for each interactive story to a fictionalised account of a difficult decision a student had to make. Students can populate their story both with the actual choices they made which led up to the difficult decision as well as options or paths they didn't take. Imagining what might have happened to their fictional protagonist had they made a different choice allows students to process their own lives and grow in self-awareness at the same time it gives readers a rich experience of real consequences--positive or negative--for the choices they make.

Group project idea

Drawing on the individual project above, a

group interactive story could involve a set beginning provided by the educator after which each member in the group offers a different choice at each of the story's crossroads. These choices could be what the students themselves would do, or wish they would do, or something they would never do but still wish to explore. For example, the teacher could give a story prompt such as the protagonist finds a large sum of money, or an abandoned house, or even a magical portal to another land. The greater the opportunity to introduce meaningful conflict and difficult moral choices, the more robust and complex the student projects will be. From there, each group sets out on writing their story, making choices and forcing the reader to make choices along the way. The story prompt can dovetail with learning objectives from other subjects--history, science, math, foreign languages--or be completely student-chosen based on individual interests. For example, if the theme of the term were climate change, each group could be given one aspect of climate change to address in their creative project, or the teacher could decide on a particular prompt: mockumentary of a fictional global disaster, close examination of small-town life while coping with increasingly extreme weather, or tense political drama of the effort to curtail pollution. The limits lie only with the outer edges of the imagination.

Conclusion

Despite the barriers to mainstream publication mentioned above, digital tools such as Twitter and Twine, as well as other free publishing resources, allow young and aspiring writers to introduce their ideas to the internet and the global public, regardless of the serious hindrances of institutionalised racism, sexism, and other systemic oppressions. Students can engage with other students and writers from around the world, whether they are writing fiction or code, and can use the ideas gleaned from a multitude of subjects and modes to become well rounded, well

informed citizens. There is much more research to be done on the role of digital self-publication on an individual's career success over time as well as the impact that freely available modes of self-expression have on breaking open the gates on traditional publication. Further research is necessary to explore the effect that mass accessibility to a global platform will have on intransigent bastions of inequality and privileged power, especially in the field of

interactive fiction's effect on members of privileged and marginalised groups alike. Despite the unanswered questions, educators can still take concrete steps to prepare their students for the globalised economy by helping them learn, practise, and perfect the tools of creativity, creative problem-solving, and agile, flexible, and divergent thinking by combining creative writing and coding in the classroom.

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